WHAT IS CLAIMED:

1. An isolated nucleic acid encoding a mutant subtype 2 metabotropic glutamate receptor (mutant mGluR2) which comprises an amino acid sequence selected from the group consisting of SEQ.ID.NOS.:1-7, and SEQ.ID.NO.:8.

2. A composition comprising an isolated nucleic acid containing a sequence encoding a mutant subtype 2 metabotropic glutamate receptor as claimed in claim 1, wherein said isolated nucleic acid sequence is selected from the group consisting of:

a) SEQ.ID.NOS.:9-16;

b) a nucleic acid compound complementary to any sequence of (a); and

c) a fragment of (a) or (b) that is at least 144 base pairs in length which will selectively hybridize to human genomic DNA encoding a human metabotropic glutamate receptor, and which will encode for the section of the mutant mGluR2 comprising altered amino acids at at least one of positions 688, 689 and 735.

3. The composition of claim 2 wherein the isolated nucleic acid is deoxyribonucleic acid.

4. The composition of claim 3 which is any sequence of (a) or a sequence complementary to (a).

5. The composition of claim 3 which is pCDNA3.1.

6. The composition of claim 2 wherein the isolated nucleic acid is ribonucleic acid.

7. The composition of claim 6 which is any sequence of (b) or a fragment thereof.

8. An expression vector capable of producing a mutant mGluR2 receptor or a fragment thereof in a host cell which comprises a nucleic acid as claimed in claim 2 in combination with regulatory elements necessary for expression of the nucleic acid in the host cell.

9. The expression vector of claim 8 for use in a host cell wherein the host cell is a mammalian cell line.

10. The expression vector of claim 9 which comprises a CMV promoter.

11. The expression vector of claim 10 which further comprises an adenovirus late promoter.

12. The expression vector of claim 11 wherein the mammalian cell line is the HEK-293 cell line.

13. A transfected host cell harboring an expression vector as claimed in claim 8.

14. A transfected host cell as claimed in claim 13 which is a transfected mammalian cell line.

15. A transfected host cell as claimed in claim 14 which is HEK-293 transfected with pCDNA3.1.

16. An isolated mutant mGluR2 receptor which comprises the amino acid sequence selected from the group consisting of SEQ.ID.NOS.:1-7, and SEQ.ID.NO:8.

17. A method for producing a mutant mGluR2 protein comprising the steps of:

a) expressing a gene sequence is selected from the group consisting of SEQ.ID.NOS.:9-16, and conservative variants thereof, in a suitable host cell such that a recombinant protein comprising any of SEQ.ID.NO.:1-8 is expressed; and

b) purifying said recombinant protein by any suitable method.

18. A mutant mGluR2 protein produced by the method of claim 17.

19. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of aspartic acid for asparagine at amino acid position 735 of said mGluR2

(SEQ.ID.NO.:1), whereby said mutant form depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane region 5 of said mGluR2.

20. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR2 (SEQ.ID.NO.:4), whereby said mutant form depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane region 4 of said mGluR2.

21. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of valine for glycine at amino acid position 689 of said mGluR2 (SEQ.ID.NO.:3), whereby said mutant form depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane region 4 of said mGluR2.

22. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR2 and aspartic acid for asparagine at amino acid position 735 of said mGluR2 (SEQ.ID.NO.:6), whereby said mutant form depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane regions 4 and 5 of said mGluR2.

23. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of valine for glycine at amino acid position 689 of said mGluR2 and aspartic acid for asparagine at amino acid position 735 of said mGluR2 (SEQ.ID.NO.:2), whereby said mutant form depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane regions 4 and 5 of said mGluR2.

24. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR2, valine for glycine at amino acid position 689 of said mGluR2, and aspartic acid for asparagine at amino acid position 735 of said mGluR2 (SEQ.ID.NO.:3), whereby said mutant form depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane regions 4 and 5 of said mGluR2.

25. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR2 and valine for glycine at amino acid position 689 of said mGluR2, (SEQ.ID.NO.:5), whereby said mutant form

depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane region 4 of said mGluR2.

26. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR2, valine for glycine at amino acid position 689 of said mGluR2, threonine for alanine at amino acid position 733 of said mGluR2, and aspartic acid for asparagine at amino acid position 735 of said mGluR2 (SEQ.ID.NO.:8), whereby said mutant form depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane regions 4 and 5 of said mGluR2.

27. An isolated nucleic acid molecule comprising a sequence of nucleotides encoding a mutant form of mGluR2, said isolated nucleic acid molecule selected from the group consisting of SEQ.ID.NOS.:9-16, wherein said mutant form of mGluR2 depotentiates glutamate activity.

28. The isolated nucleic acid molecule of claim 27 further comprising a nucleotide sequence encoding a polypeptide fused to an amino or carboxy terminal of said isolated nucleic acid molecule.

29. The isolated nucleic acid molecule of claim 27, wherein said molecule is operatively linked to a promoter within an expression vector, and said mutant form of mGluR2 is stably expressed.

30. The isolated nucleic acid molecule of claim 27, wherein said molecule is operatively linked to a promoter within an expression vector, and said mutant form of mGluR2 is transiently expressed.

31. An expression vector comprising the isolated nucleic acid of claim 27.

32. A mutant form of GPCR class II receptor mGluR2 comprising a substitution of aspartic acid for asparagine at amino acid position 744 of said mGluR3 (SEQ.ID.NO.:33), whereby said mutant form depotentiates glutamate receptor activity by altering an allosteric site associated with transmembrane region 5 of said mGluR3.

33. A mutant form of GPCR class II receptor mGluR3 comprising a substitution of leucine for serine at amino acid position 697 of said mGluR3 (SEQ.ID.NO.:36), whereby said mutant form potentiates glutamate receptor activity by altering an allosteric site associated with transmembrane region 4 of said mGluR3.

34. A mutant form of GPCR class II receptor mGluR3 comprising a substitution of valine for glycine at amino acid position 698 of said mGluR3 (SEQ.ID.NO.:39), whereby said mutant form potentiates glutamate receptor activity by altering an allosteric site associated with transmembrane region 4 of said mGluR3.

35. A mutant form of GPCR class II receptor mGluR3 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR3 and aspartic acid for asparagine at amino acid position 735 of said mGluR3 (SEQ.ID.NO.:38), whereby said mutant form potentiates glutamate receptor activity by altering an allosteric site associated with transmembrane regions 4 and 5 of said mGluR3.

36. A mutant form of GPCR class II receptor mGluR3 comprising a substitution of valine for glycine at amino acid position 689 of said mGluR3 and aspartic acid for asparagine at amino acid position 735 of said mGluR3 (SEQ.ID.NO.:34), whereby said mutant form potentiates glutamate receptor activity by altering an allosteric site associated with transmembrane regions 4 and 5 of said mGluR3.

37. A mutant form of GPCR class II receptor mGluR3 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR3, valine for glycine at amino acid position 689 of said mGluR3, and aspartic acid for asparagine at amino acid position 735 of said mGluR3 (SEQ.ID.NO.:35), whereby said mutant form potentiates glutamate receptor activity by altering an allosteric site associated with transmembrane regions 4 and 5 of said mGluR3.

38. A mutant form of GPCR class II receptor mGluR3 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR3 and valine for glycine at amino acid position 689 of said mGluR3, (SEQ.ID.NO.:37), whereby said mutant form potentiates glutamate receptor activity by altering an allosteric site associated with transmembrane region 4 of said mGluR3.

39. A mutant form of GPCR class II receptor mGluR3 comprising a substitution of leucine for serine at amino acid position 688 of said mGluR3, valine for glycine at amino acid position 689 of said mGluR3, threonine for alanine at amino acid position 733 of said mGluR3, and aspartic acid for asparagine at amino acid position 735 of said mGluR3 (SEQ.ID.NO.:40), whereby said mutant form potentiates glutamate receptor activity by altering an allosteric site associated with transmembrane regions 4 and 5 of said mGluR3.

40. A method to evaluate the relative specificity of an mGluR2 modulator under investigation with regard to mGluR3, comprising:

a) preparing at least one replicate of each of the following separate test treatments:

1. a positive reference control, with wild-type mGluR2, lacking said mGluR2 modulator; and to receive a high dose of glutamate;

2. a negative reference control, with wild-type mGluR2, lacking said mGluR2 modulator; and to receive a low dose of glutamate;

3. an mGluR2 baseline treatment, with wild-type mGluR2, lacking said mGluR2 modulator; and to receive an intermediate dose of glutamate;

4. an mGluR2 modulator treatment, with wild-type mGluR2, with said mGluR2 modulator; and to receive an intermediate dose of glutamate;

5. at least one mutant mGluR2 polypeptide selected from the group consisting of SEQ.ID.NOS.:1-8, each mutant comprising a separate treatment and each lacking said mGluR2 modulator, and to receive an intermediate dose of glutamate; and

6. the same mutant(s) as a.4., each mutant comprising a separate treatment and each with said mGluR2 modulator, and to receive an intermediate dose of glutamate;

b) adding said specified doses of glutamate;

c) after a specified time, for each treatment, measuring the level of glutamate response by an appropriate method; and

d) comparing said respective levels of glutamate response to assess the relative specificity of said mGluR2 modulator to mGluR2 and said at least one mutant with and without modulator,

wherein a specified lower percentage of response by said at least one mutant with modulator, relative to said mGluR2 modulator treatment, indicates specificity of said modulator for mGluR2.

41. An isolated nucleic acid encoding a mutant subtype 2 metabotropic glutamate receptor (mutant mGluR2) which comprises an amino acid sequence selected from the group consisting of SEQ.ID.NOS.:1-7, and SEQ.ID.NO.:8, and conservative variations thereof.

42. An isolated mutant mGluR2 receptor which comprises the amino acid sequence selected from the group consisting of SEQ.ID.NOS.:1-7, and SEQ.ID.NO.:8, and conservative variations thereof.